SITE INSPECTION WORKSHEETS
(Region I version 6/30/95)

SEMS DocID 621089

WARNING!!
EPA has determined that the status and HRS score of any site that is progressing towards listing on th NPL is confidential. Deliberations regarding listing issues, the site specific status, and HRS scores cannot be released or discussed with non-Agency persons. For additional guidance see April 30, 1993 OSWER Directive 9320.1-11.

SITE LOCATION			
Site Name: **FIBER MATERIALS INC.**			
Street Address: **5 Morin Street, Biddeford Industrial Park**			
City: **Biddeford**	State: **ME**	Zip Code: **04005**	Telephone: **207-282-7529**
CERCLIS ID#: **MED048268890**	Coordinates:	Latitude: **43°28'13"** Longitude: **70°29'28"**	

OWNER/OPERATOR IDENTIFICATION					
Owner: **Fiber Materials Inc.**			Operator: **Same**		
Owner Address: **see above**			Operator Address:		
City:			City:		
State:	Zip Code:	Telephone:	State:	Zip Code:	Telephone:

SITE EVALUATION			
Agency/Organization: **Maine Department of Environmental Protection**		TDD#:	
Investigator: **Jean Firth**		Date:	**October 23, 2003**

EPA CONTACT				
EPA SAM:	**Mr. Gerardo Millan-Ramos**			
Address:	**1 Congress Streeet Suite 1100 (HBS)**			
City:	**Boston**	State:	**MA**	Zip Code: **02114-02203**
Telephone:	**(617) 918-1377**			
EPA Reviewer:		Date:		

GENERAL INFORMATION

Fiber Materials Incorporated (FMI) is located at 5 Morin Street, Biddeford Industrial Park, Biddeford, Maine at approximately 43°28'13" north latitude and 70°29'28" west longitude (Figure 1). FMI is bordered to the north by Precourt Street, to the east by residential property to the south by commercial property and to the west by Morin Street. Land use in the area of the FMI property is a mixture of industrial and residential uses. The total acreage of all the tracts is approximately 14 acres (4).

The FMI facility is comprised of five buildings (Figure 2). Building 1 is one structure with three buildings attached together and is located on the northwest corner of the site. Each of the component buildings making up Building 1 were built at separate times and are currently referred to as Work Areas. Work Area 1 was built in 1975 and has an area of 20,000 square feet (ft^2). Work Area 2 and Work Area 6, both approximately 13,000 ft^2 were added in 1976 and 1979-1980 respectively. Building 3, located east of Building 1, was built in 1977 and has an area of 20,000 ft^2. Building 4, a two-story building built in 1977/1978, occupies 60,000 ft^2 on the east side of the property south of Building 3. Building 5 is located on the southeast corner or the site, was built in 1979/1980, and has an area of 20,000 ft^2. Built in 1980, the Hazardous Materials Storage Building along with the Nitrogen Storage Area is located near the northeast corner of the site. The #1 Hazardous Materials Storage Building has an area of approximately 600 ft^2 (4).

Parking areas on the property are paved although driveways around the buildings are unpaved. Grass and some shrubs surround most of the buildings. The southwest corner of the site is vegetated with shrubs and trees. During site visits several ledge outcrops at various locations throughout the site were noted.

There are 32 RCRA notifiers and 6 CERCLA sites in the Biddeford-Saco area. Abutters to the property include a residential area to the east, a vacated warehouse to the south, the Biddeford Textile Company across the street to the west, and the turnpike connector road running along the north side of the property.

The access to the property is restricted by a ten-foot high chain-linked fence with three strands of barbed wire on top. There is a visitor's parking area outside the fence with a pedestrian access gate. The employee's entrance is on the southwest corner of the lot in front of Building 5. Only employees may drive on the property during shift changes. The pedestrian gate and the employee vehicle gate are open from 6:00 AM to 7:00 PM Monday through Friday to allow visitors to enter and the employee shift changes. The FMI operation runs twenty-four hours a day with two twelve hour shifts and security is present at all times (4).

The 1992 TRCC Preliminary Assessment Plus Report (PA+) identified 7 Areas of Concern (AOCs). These are detailed in Appendix A.

The FMI site, prior to development, was first a farm then became a sand and gravel borrow pit. FMI bought one of tract of the property from the Town of Biddeford in 1971, a second tract in 1975 and a final tract from Richard Harper in 1975 (4).

FMI began manufacturing aerospace composite materials onsite in 1975. Products manufactured are carbon fiber-impregnated components used as missile nose cones and rocket engine nozzles. Composite materials are made by weaving metallic or synthetic materials into 2-dimensional and 3-dimensional shapes, which are impregnated with resin at high temperatures and pressures (16:p2). FMI also manufactures insulation material used for industrial purposes (4).

Work Area 1 is primarily where weaving takes place. Hazardous waste generated previously in this area was from the production of metal "rods", which is thin wire-like material. In this area the rod is spun off reels and cut to length. They were then passed through three trays if cleaning solution containing oakite, acetone, and water. Currently the solutions consist of Spic and Span (a commercially available cleaning agent) and alcohol. The solution containing oakite, acetone and water was considered hazardous and according to FMI comprised a very small waste stream. The product manufactured is a 2 or 3-dimensional shape of a specified configuration (e.g. nose cones, nozzles, etc.)(4; 16:p2).

Work Area 2 is where the densification of the shaped fabrics or composites produced in Work Area 1 are impregnated with either petroleum pitch, coal tar pitch, or furfuryl alcohol-based resin (also referred to as P-3). The composites, which are formed, undergo extreme heat treatment in vessels called carbonizers. Exhaust from the carbonizers goes through an incinerator to drive off volatiles. Next the composites are put into another vessel where they are pressurized and carbonized. The exhaust from this procedure goes through a scrubber. Two wastes are generated in this process: coke clinkers and spent caustic soda scrubber solutions (which has a pH greater than 12) (4).

Fiber-form is produced in Building 3. This product is a heat resistant material, which is used as insulation in industrial furnaces. Fiber, synthetic resin, and water are mixed into slurry, cast into billets, air-dried, baked in ovens, then graphitized at 2700°C in an induction furnace. Each of the heating units has incinerators to control their gaseous emissions. No hazardous waste is produced from this process (4; 16:p2). The industrial (induction) furnaces had capacitors containing PCBs. FMI is in the process of replacing these capacitors.

Building 4 is where the administration and research laboratories are located. In addition, high strength-small diameter fiber is produced in Building 4. Rolls of fiber are passed through a stretch oven and a box oven and then through high temperature ovens (2700°C). Exhaust gas from the ovens passes through a packed tower-recircuitating scrubber, which removes hydrogen cyanide gas from the exhaust air stream. At the time of the TRCC site visit, space in this building was used for research and development and general office work only. X-ray processes, which occur in this building, are a part of the research and development work (4; 16:p3).

Building 5 currently houses the flex-fram process and previously was used for manufacturing "sputtering targets." One of the operations involved grinding down sulfide plates, which are used as "sputtering targets" in the electronic industry. A cadmium sulfide slurry waste was generated in a very small quantity as well as pieces of cadmium sulfide plates. This process was discontinued years ago according to FMI. The second process involves the production of "flex-fram" which is a flame-retardant material that has a mud-like consistency. The process involves mixing various solvents and epoxy resin in a Hobart mixer. Waste epoxy resin solution is treated as hazardous waste and was manifested off-site at a range of three 55 gallon drums in 1984 (16).

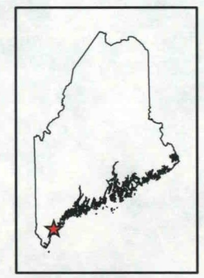
Information regarding Hazardous Waste Area #1 and #2 as well as Work Area 6 is detailed in Appendix A under three appropriate AOC designations.

All wastes generated in each area were stored in either Hazardous Material Storage Area #1 or #2 until manifested offsite by a licensed transporter.

Figure 1: Site Location

Fiber Materials, Inc Facility
Biddeford, Maine

- SITE
- CLOSEST DOMESTIC WELL
- PUBLIC DRINKING WATER WELLS
- 1 MILE BUFFER



Data Sources: Background hydrologic, topographic and political features are from Maine OGIS data layers with an accuracy of +/- 40 ft.

Facility structures digitized from CAD file produced by Fiber Materials, Inc and georeferenced digitial orthophoto quad.

Sample locations and stream data collected by Maine DEP using Trmble Pro-XR GPS unit on September 13, 2001. Accuracy +/- 3 ft.

Map prepared by: Chris Halsted
Maine DEP GIS Unit, 9/3/02
Revised 10/15/03

THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY

N
W E
S

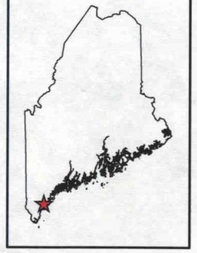
0 0.25 0.5 Miles

4

Figure 2: Site Diagram

Fiber Materials, Inc Facility
Biddeford, Maine

- Public_Drinking_Water_Wells
- CATCH BASIN
- BUILDING
- Elevation_Contours
- STREAM
- Streams
- Rivers
- Large Wetlands (polys)
- DRIVEWAY
- FENCE
- PAVED ROAD
- Private
- Park Road
- Seasonal parkway
- State aided
- State hwy
- Town Road - summer
- Town Road - winter
- Toll highway
- Town Road
- Railroads



Data Sources: Background hydrologic, topographic and political features are from Maine OGIS data layers with an accuracy of +/- 40 ft.

Facility structures digitized from CAD file produced by Fiber Materials, Inc and georeferenced digitial orthophoto quad.

Sample locations and stream data collected by Maine DEP using Trmble Pro-XR GPS unit on September 13, 2001. Accuracy +\- 3 ft.

Map prepared by: Chris Halsted
Maine DEP GIS Unit, September 3, 2002.

THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY

N
W E
S

0 50 100 200 Feet

4A

SOURCE EVALUATION

Description of each Source:
Identify each source area by name and number, and classify each source into a source type category (See Table 1). Determine the dementions of each source.
Identify the hazardous substances associated with each source. Determine the containment characteristics for each source by pathway (see HRS Tables 3-2, 4-2, 6-3 and 6-9).

Source 1: Contaminated Soil (Tier D)

There were no observed areas of contamination at the FMI facility, however no soil samples were collected from the site to confirm whether or not there is contamination. Therefore, the entire site will be evaluated as if it is contaminated. The site is 14 acres; hazardous substances used at the facility include: metals, PCBs, semi-volatile organic compounds, volatile organic compounds and acids (54).

Source 2: Discharge to the POTW (Waste Source Tier B)

FMI discharges 1000 gallons a day of wastewater to the Biddeford POTW. It is assumed that this has occurred since the facility was built in 1975.

Source 3: Discharge from Bld #3 (Wastesource Tier B)

Between December 1989 and April 1990 FMI discharged greater than 100 gallons of Thoroguard treated water to Thacher Brook. Thoroguard contains phenol up to 2300 ppm (26; 28).

Source #	Source Type	Pathway Availability			
		GW	SW	SE	A
1	Contaminated Soil	y	y	y	y
2	Waste Stream	n	y	n	n
3	Waste Stream	n	y	n	n
4					
5					
6					
7					
8					
9					

Legend: Y = available to pathway
N = not available to pathway
? = availability unknown
I = ineligible waste

Hazardous Waste Quantity (HWQ) Calculations: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).
For each source, provide HWQ calculations by tier and provide assumptions
Note: HWQ calculations may be different for the soil exposure pathway

Source 1: Contaminated Soil (Tier D)

The site is 14 acres in size.
14 acres /0.78 = 17.95

Source 2: Discharge to the POTW (Waste Source Tier B)
FMI discharges 1000 gallons a day to the City of Biddeford POTW.

1000 gallons / day x 350 days/year x 28 years =9,800,000 gallons

9,800,000 gallons / 5000 = 1960

Source 3: Discharge from Bld #3 (Wastesource Tier B)

Greater than 100 gallons of water was discharged to Thacher Brook.
100 gallons/5000 = 0.02

Source 1 is available to soil, groundwater and air. Total HWQF = 17.95

Sources 1, 2 and 3 are available to surface water. Total HWQF = 1977.97

GW HWQ =	**10**
SW HWQ =	**100**
SE HWQ =	**10**
AIR HWQ =	**10**

SI TABLE 1:

HAZARDOUS WASTE QUANTITY (HWQ SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

TIER	Source Type	Single Source Sites (assigned HWQ scores) HWQ = 10	HWQ = 100	HWQ = 10,000	HWQ = 1,000,000	Multiple Source Sites Divisors for Assigning Source WQ Values
A Hazardous Constituent Quantity	N/A	HWQ = 1 if Hazardous Constituent Quantity data are complete HWQ = 10 if Hazardous Constituent Quantity data are not complete	>100 to 10,000 lbs	>10,000 to 1 million lbs	> 1 million lbs	lbs. ÷ 1
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	> 500,000 to 50 million lbs	>50 million to 5 billion lbs	> 5 billion lbs	lbs ÷ 5,000
C Volume	Landfill	≤ 6.75 million cubic ft ≤ 250,000 cubic yds	>6.75 million to 675 million cubic ft >250,000 to 25 million cubic yds	>675 million to 67.5 billion cubic ft >25 million to 2.5 billion cubic yds	>67.5 billion cubic ft > 2.5 billion cubic yds	cubic ft. ÷ 67,500 cubic yds. ÷ 2,500
	Surface Impoundment	≤ 6,750 cubic ft ≤ 250 cubic yds	>6,750 to 675,000 cubic ft >250 to 25,000 cubic yds	>675,000 to 67.5 million cubic ft >25,000 to 2.5 millioncubic yds	>67.5 million cubic ft > 2.5 million cubic yds	cubic ft. ÷ 67.5 cubic yds. ÷ 2.5
	Drums	≤ 1,000 drums	>1,000 to 100,000 drums	>100,000 to 10 million drums	>10 million drums	drums ÷ 10
	Tanks and non-drum containers	≤ 50,000 gallons	50,000 to 5 million gallons	5 million to 500 million gallons	> 500 million gals	gallons ÷ 500
	Contaminated soil	≤ 6.75 million cubic ft ≤ 250,000 cubic yds	>6.75 million to 675 million cubic ft >250,000 to 25 million cubic yds	>675 million to 67.5 billion cubic ft >25 million to 2.5 billion cubic yds	>67.5 billion cubic ft > 2.5 billion cubic yds	cubic ft. ÷ 67,500 cubic yds. ÷ 2,500
	Pile	≤ 6,750 cubic ft ≤ 250 cubic yds	>6,750 to 675,000 cubic ft >250 to 25,000 cubic yds	>675,000 to 67.5 million cubic ft >25,000 to 2.5 million cubic yds	>67.5 million cubic ft > 2.5 million cubic yds	cubic ft. ÷ 67.5 cubic yds. ÷ 2.5
	Other	≤ 6,750 cubic ft ≤ 250 cubic yds	>6,750 to 675,000 cubic ft >250 to 25,000 cubic yds	>675,000 to 67.5 million cubic ft >25,000 to 2.5 million cubic yds	>67.5 million cubic ft > 2.5 million cubic yds	cubic ft. ÷ 67.5 cubic yds. ÷ 2.5

SI TABLE 1:

HAZARDOUS WASTE QUANTITY (HWQ SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

TIER	Source Type	Single Source Sites (assigned HWQ scores) HWQ = 10	HWQ = 100	HWQ = 10,000	HWQ = 1,000,000	Multiple Source Sites Divisors for Assigning Source WQ Values
D Area	Landfill	≤ 340,000 ft² ≤ 7.8 acres	> 340,000 to 34 million ft² >7.8 to 780 acres	>34 million to 3.4 billion ft² >780 to 78,000 acres	>3.4 billion ft² >78,000 acres	ft² ÷ 3,400 acres ÷ 0.078
	Surface Impoundment	≤ 1,300 ft² ≤ 0.029 acres	> 1,300 to 130,000 ft² >0.029 to 2.9 acres	>130,000 to 13 million ft² >2.9 to 290 acres	>13 million ft² >290 acres	ft² ÷ 13 acres ÷ 0.00029
	Contaminated soil	≤ 3.4 million ft² ≤ 78 acres	>3.4 million ft² to 340 million ft² >78 to 7,800 acres	>340 million to 34 bil. ft² >7,800 to 780,000 acres	>34 billion ft² >780,000 acres	ft² ÷ 34,000 acres ÷ 0.78
	Pile	≤ 1,300 ft² ≤ 0.029 acres	>1,300 to 130,000 ft² >0.029 to 2.9 acres	>130,000 to 13 million ft² >2.9 to 290 acres	>13 million ft² >290 acres	ft² ÷ 13 acres ÷ 0.00029
	Land treatment	≤ 27,000 ft² ≤ 0.62 acres	>27,000 to 2.7 million ft² >0.62 to 62 acres	>2.7 mil. to 270 million ft² >62 to 6,200 acres	>270 million ft² >6,200 acres	ft² ÷ 270 acres ÷ 0.0062

1 ton = 2,000 lbs = 1 cubic yd. = 4 drums = 200 gallons

SI TABLE 2: HWQ SCORES FOF MULTIPLE SOURCE SITES

SITE WQ Total	HWQ Score
0	0
1 (a) to 100	1(b)
>100 to 10,000	100
>10,000 to 1,000,000	10000
>1,000,000	1000000

(a) If the WC total is between 0 and 1, round to 1.

(b) If the hazardous constituent quantity data are not complete, assign the score of 10.

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Enter "NA" for substances which are not available to a pathway.
Enter "NL" for substances values not listed in SCDM.
Enter "- -" for values not calculated due to substances values not listed in SCDM.
Provide footnote for substances listed in table but not used for scoring purposes
(e.g. BTEX substances attributable to a gasoline tank.)

Sources:
1. Contaminated Soil
2. Discharge to POTW
3. Discharge from Bld #3
4.

SCDM Version: June 1996

				GROUNDWATER PATHWAY		SURFACE WATER PATHWAY: OVERLAND/FLOOD MIGRATION							SURFACE WATER PATHWAY: GROUNDWATER TO SURFACE WATER				AIR PATHWAY			
Source	SCDM ref.	Hazardous Substance	Toxicity	GW Mobility (HRS Table 3-8)	Tox. x Mobility Value (HRS Table 3-9)	Pers. (HRS Tables 4-10 and 4-11)	Tox. x Pers. Value (HRS Table 4-12)	Bioacc. Pot. (HRS Table 4-15)	Tox. x Pers. x Bioacc. Value (HRS Table 4-16)	Ecotox. (HRS Table 4-19)	Ecotox. x Pers. (HRS Table 4-20)	Eco. Bioacc. Pot. (HRS Table 4-20)	Ecotox. x Pers. x Eco. Bioacc. Value (HRS 4-21)	Tox. x Mob. x Pers. Value (HRS table 4-26)	Tox. x Mob. x Pers. x Value (HRS table 4-28)	Ecotox. x Mob. x Pers. Value (HRS Table 4-29)	Ecotox. x Mob. x Pers. x Ecobioacc. Value (HRS Table 4-30)	Gaseous/ Particulate (HRS Table 6-13) (G or P)	Mobility (HRS Table 6-11, 6-12)	Tox. x Value (HRS Table 6-13)	Reference
1	B-1	Acenaphthene	10	0.01	0.1	0.4	4	500	2,000	10,000	4,000	500	2E+06	0.04	20	40	20,000	G/P	0.2	2	41:p3
1	B-1	Acenaphthylene	NL	1	---	0.4	---	500	---	NL	---	500	---	--	--	--	---	G/P	0.02	---	41:p3
1	B-1	Acetone	10	1	10	0.4	4	0.5	2	100	40	0.5	20	4	2	40	20	G	1	10	54
1	B-1	Ammonia	100	1	100	0.0007	0.07	0.5	0.035	100	0.07	0.5	0.035	0.07	0.035	0.07	0.035	G	1	100	9
1	B-2	Anthracene	10	0.01	0.1	1	10	5,000	50,000	10,000	10,000	5,000	5E+07	0.1	500	100	5E+05	G/P	0.002	0.02	41:p3
	B-2	ARSENIC	10,000	0.01	100	1	10,000	5	50,000	10	10	500	5E+03	100	500	0	5E+01	P	0.000	0.8	3
1	B-2	BARIUM	10	0.01	0.1	1	10	0.5	5	1	1	0.5	0.5	0.1	0.05	0.01	0.005	P	8E-05	0.0008	41:p3, 4
1	B-2	Benzene	100	1	100	0.4	40	5,000	2E+05	100	40	500	20,000	40	2E+05	40	20,000	G	1	100	54
1	B-2	Benzo(a)pyrene	10,000	0.0001	1	1	10,000	50,000	5E+08	10,000	10,000	50,000	5E+08	1	50,000	1	50,000	G/P	0.0002	2	41:p3
1	B-3	Benzo(b)fluoranthene	1,000	0.0001	0.1	1	1,000	50,000	5E+07	NL	---	50,000	---	0.1	5,000	---	---	G/P	0.002	2	41:p3
1	B-3	Benzo(g,h,i)perylene	NL	0.0001	---	1	---	50,000	---	NL	---	50,000	---	---	---	---	---	P	8E-05	---	41:p3
1	B-3	Benzo(j,k)fluorene	100	0.0001	0.01	1	100	5,000	5E+05	10,000	10,000	5,000	5E+07	0.01	50	1	5,000	G/P	0.0002	0.02	41:p3
1	B-3	Benzo(k)fluoranthene	100	0.0001	0.01	1	100	50,000	5E+06	NL	---	50,000	---	0.01	500	---	---	G/P	0.0002	0.02	41:p3
1	B-3	Benz(a)anthracene	1,000	0.01	10	1	1,000	50,000	5E+07	10,000	10,000	50,000	5E+08	10	5E+05	100	5E+06	G/P	0.002	2	41:p3
1	B-13	Butanone, 2- (MEK)	10	1	10	0.4	4	0.5	2	1	0.4	0.5	0.2	4	2	0.4	0.2	G	1	10	54
1	B-4	Butylbenzyl phthalate	10	0.01	0.1	1	10	500	5,000	100	100	500	50,000	0.1	50	1	500	G/P	0.002	0.02	41:p3
1	B-4	CADMIUM	10,000	0.01	100	1	10,000	5,000	5E+07	1,000	1,000	5,000	5E+06	100	5E+05	10	50,000	P	8E-05	0.8	41:p3, 4
1	B-4	Carbon tetrachloride	1,000	1	1,000	0.4	400	50	20,000	100	40	50	2,000	400	20,000	40	2,000	G	1	1000	54
1	B-5	Chloroform	100	1	100	0.4	40	5	200	10	4	5	20	40	200	4	20	G	1	100	54
1	B-5	Chrysene	10	0.01	0.1	1	10	500	5,000	1,000	1,000	5,000	5E+06	0.1	50	10	50,000	G/P	0.0002	0.002	41:p3
1	B-6	CYANIDE	100	1	100	0.4	40	0.5	20	1,000	400	0.5	200	40	20	400	200	P	8E-05	0.008	9
1	B-7	Dibenzofuran	NL	0.01	---	1	---	500	---	100	100	500	50,000	---	---	1	500	G/P	0.02	---	41:p3
1	B-7	Dibenz(a,h)anthracene	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	41:p3
1	B-7	Dibromochloromethane	100	1	100	0.4	40	50	2,000	NL	---	50	---	40	2,000	---	---	G	1	100	41:p3
1	B-9	Di-n-butyl phthalate	10	0.01	0.1	1	10	5,000	50,000	1,000	1,000	5,000	5E+06	0.1	500	10	50,000	G/P	0.02	0.2	41:p3
1	B-10	Fluoranthene	100	0.01	1	1	100	5,000	5E+05	10,000	10,000	500	5E+06	1	5,000	100	50,000	G/P	0.002	0.2	41:p3
1	B-10	Fluorene	100	0.01	1	1	100	5,000	5E+05	1,000	1,000	5,000	5E+06	1	5,000	10	50,000	G/P	0.02	2	41:p3
2	B-11	HpCDF, 1,2,3,4,6,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	42:p10
2	B-11	HpCDF, 1,2,3,4,6,7,9-	NL	NL	---	0.4	---	0.5	---	NL	---	0.5	---	---	---	---	---	P	8E-05	---	42:p10
2	B-11	HxCDD, 1,2,3,6,7,8-	10,000	NL	---	0.4	4,000	5,000	2E+07	10,000	4,000	5,000	2E+07	---	---	---	---	P	8E-05	0.8	42:p10
2	B-11	HxCDF, 1,2,3,4,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	42:p10
2	B-12	HxCDF, 1,2,3,6,7,8-	10,000	NL	---	0.4	4,000	0.5	2,000	NL	---	0.5	---	---	---	---	---	P	8E-05	0.8	42:p10
1	B-12	Indeno(1,2,3-cd)pyrene	1,000	0.0001	0.1	1	1,000	50,000	5E+07	NL	---	50,000	---	0.1	5,000	---	---	P	8E-05	0.08	41:p3
1	B-13	MERCURY	10,000	0.01	100	0.4	4,000	50,000	2E+08	10,000	4,000	50,000	2E+08	40	2E+06	40	2E+06	G/P	0.2	2000	54
1	B-13	Methy Ethyl Ketone (MEK)	10	1	10	0.4	4	0.5	2	1	0.4	0.5	0.2	4	2	0.4	0.2	G	1	10	54
1	B-14	Methylene chloride	10	1	10	0.4	4	5	20	1	0.4	5	2	4	20	0.4	2	G	1	10	54
1	B-14	Naphthalene	100	1	100	0.4	40	500	20,000	1,000	400	500	2E+05	40	20,000	400	2E+05	G/P	0.2	20	41:p3
2	B-15	OCDD	NL	NL	---	NL	---	NL	---	NL	---	NL	---	---	---	---	---	NL	NL	---	42:p10
2	B-15	OCDF	NL	NL	---	NL	---	NL	---	NL	---	NL	---	---	---	---	---	NL	NL	---	42:p10
1	B-16	PCBs	10,000	0.01	100	1	10,000	50,000	5E+08	10,000	10,000	50,000	5E+08	100	5E+06	100	5E+06	G	0.02	200	43; 44
2	B-16	PeCDD, 1,2,3,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	10,000	10,000	50,000	5E+08	1	50,000	1	50,000	P	8E-05	0.8	42:p10

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Enter "NA" for substances which are not available to a pathway.
Enter "NL" for substances values not listed in SCDM.
Enter "- -" for values not calculated due to substances values not listed in SCDM.
Provide footnote for substances listed in table but not used for scoring purposes
(e.g. BTEX substances attributable to a gasoline tank.)

Sources:
1. Contaminated Soil
2. Discharge to POTW
3. Discharge from Bld #3
4.

SCDM Version: June 1996

			GROUNDWATER PATHWAY		SURFACE WATER PATHWAY - OVERLAND/FLOOD MIGRATION								SURFACE WATER PATHWAY - GROUNDWATER TO SURFACE WATER				AIR PATHWAY			
Source	SCDM Ref.	Hazardous Substance	Toxicity	GW Mobility (HRS Table 3-8)	Tox. x Mobility Value (HRS Table 3-9)	Pers. (HRS Tables 4-10 and 4-11)	Tox. x Pers. Value (HRS Table 4-12)	Bioacc. Pot. (HRS Table 4-15)	Tox. x Pers. x Bioacc. Value (HRS Table 4-16)	Ecotox. (HRS Table 4-19)	Ecotox. x Pers. (HRS Table 4-20)	Eco. Bioacc. Pot. (HRS Table 4-20)	Ecotox. x Pers. x Eco. Bioacc. Value (HRS 4-21)	Tox. x Mob. x Pers. Value (HRS table 4-26)	Tox. x Mob. x Pers. x Value (HRS table 4-28)	Ecotox. x Mob. x Pers. Value (HRS Table 4-29)	Ecotox. x Mob. x Pers. x Ecobioacc. Value (HRS Table 4-30)	Gaseous/ Particulate (HRS Table 6-13) (G or P)	Mobility (HRS Table 6-11 6-12)	Tox. x Value (HRS Table 6-13)	Reference
2	B-16	PeCDF, 1,2,3,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	42:p10
2	B-16	PeCDF, 2,3,4,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	42:p10
1	B-16	Phenanthrene	NL	0.01	--	1	--	50	--	1,000	1,000	5,000	5E+06	---	---	10	50,000	G/P	0.02	---	41:p3
1	B-17	Pyrene	100	0.01	1	1	100	50	5,000	10,000	10,000	50	5E+05	1	50	100	5,000	G/P	0.002	0.2	41:p3
1	B-18	Sulfuric acid	1,000	1	1,000	0.4	400	0.5	200	10	4	0.5	2	400	200	4	2	G/P	0.02	20	54
2	B-18	TCDD	10,000	0.0001	1	1	10,000	5,000	5E+07	10,000	10,000	5,000	5E+07	1	5,000	1	5,000	G/P	0.0002	2	42:p10
2	B-18	TCDF, 2,3,7,8-	10,000	0.0001	1	1	10,000	50,000	5E+08	NL	---	50,000	---	1	50,000	---	---	P	8E-05	0.8	42:p10
1	B-19	Toluene	10	1	10	0.4	4	50	200	100	40	50	2,000	4	200	40	2,000	G	1	10	54
1	B-19	Trichloroethane, 1,1,1-	1	1	1	0.4	0.4	5	2	10	4	5	20	0.4	2	4	20	G	1	1	54
1	B-19	Trichloroethane, 1,1,2-	1,000	1	1,000	0.4	400	50	20,000	10	4	50	200	400	20,000	4	200	G	1	1000	54
1	B-19	Trichloroethylene	10	1	10	0.4	4	50	200	100	40	50	2,000	4	200	40	2,000	G	1	10	54
1	B-20	Xylene, p- (also use for total)	10	1	10	0.4	4	50	200	100	40	50	2,000	4	200	40	2,000	G	1	10	54

SCDM Version: JUN96

NOTES:

SI Table 3 assumptions: liquid-phase waste disposed of in non-karst terrane, fresh-water river environment values.
[modify PMFV to update table]>> 8E-05 = Particulate Mobility Factor Value based on HRS Figure 6-3.

Chemical info:

BENZOFLUORANTHENE,3,4- = Benzo(b)fluoranthene
FLUORANTHENE = Benzo(j,k)fluorene
BUTANONE, 2- = Methy Ethyl Ketone (MEK)

GROUNDWATER PATHWAY

The overall topography varies, with a topographic high of 140 feet above sea level (msl) along the site's southern property line. Based on the available site maps, most of the property appears to be between 140 and 120 feet above msl (47). The general slope of the property is toward the west and the unnamed tributary of Thacher Brook.

The surficial soil is a Glaciomarine deposit with coarse-grained facies, consisting of sand, gravel and minor amounts of silt. The topography is characterized as flat to gently sloping, except where dissected by modern streams; commonly a branching network of steep-walled stream gullies (56). The site consists of sand and gravel with very shallow ledge and several outcrops.

According to a 1962 surficial geology map of Biddeford, the site area was previously used as an open gravel pit (56).

The entire site is located within a sand and gravel aquifer. The minimum thickness of sand and gravel is believed to be 12 feet. The depth to groundwater in the immediate area of the site is approximately 24 feet and downgradient of the site water table is as shallow as 4 feet (57).

The bedrock beneath the FMI property is believed to be a granite of Carboniferous age (55). Based on the observation of several outcrops on the FMI site, bedrock could be at or near the ground surface at several locations (4).

The towns of Biddeford, Saco, Arundel, Kennebunkport, and Dayton are located within four miles of the FMI site. Both private groundwater sources and a public water system serve the population within four miles. The Biddeford-Saco Water District serves the communities of Biddeford and Saco; its source of water is the Saco River upstream of the surface water pathway. They also stock the Kennebunk, Kennebunkport, and Wells Water District (KKW) with make up supplies when the KKW district source, Branch Brook, runs low.

The town of Arundel has approximately 30 percent to 40 percent of its' residents along Route 1 served by the KKW water district. The remaining population of Arundel is served by private and community wells. The portion of Kennebunkport which is included within the four mile radius is served by private wells (4). The community wells that are located within the four mile radius and the estimated number of residents served is shown in the table below (62).

Population Using Groundwater within Four Miles of
Fiber Materials Inc., Biddeford

Distance from the Site (miles)	Private Water Supply Population	Community Well Population	Total
0.0-0.25	0	0	0
0.25-0.5	0	0	0
0.5-1	78	0	78
1-2	232	205	437
2-3	339	0	339
3-4	487	0	487
TOTAL	**1,136**	**205**	**1,341**

No groundwater samples have been collected from the site because there was no apparent way to reach the groundwater without drilling monitoring wells.

SI Table 4: GROUNDWATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Note: Mobility equals 1 for all observed released substances.

Sample ID	Hazardous Substance	Substance Concentration ug/L	Bckgrd. ID	Bckgrd. Conc.	Tox. x Mob. = Tox.	References
Volatile Organic Compounds - (VOCs)						
Semi - Volatile Organic Compounds - (SVOCs)						
PCB/Pesticides						
Metals/Cyanide						
				Highest Value		

Notes: **No groundwater samples were collected from the site. For this SI evaluation it is assumed that groundwater is contaminated with a substance that has a toxicity of 1000.**

SI Table 5: GROUNDWATER ACTUAL CONTAMINATION TARGETS

Notes: Convert all results and SCDM values to ppb or μg/L.
If sum of percents calculated for I of J index is > or = 100%, consider the well a Level I target;
If sum of I or J index is < 100%, consider the well a Level II target.

Well ID: Level I: Level II: Population Served: References:

Sample ID	Hazardous Substance	Conc. (μg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	RfD (J Index)	% of RfD	Cancer Risk Conc. (I index)	% of Cancer Risk Conc.
Volatile Organic Compounds - (VOCs)								
Semi-Volatile Organic Compounds - (SVOCs)								
PCB/Pesticides								
Metals/Cyanide								
			Highest Percent		Sum of Percents		Sum of Percents	

SCDM Version: Jun-96

Notes: **There are no acutual groundwater contamination targets.**

GROUNDWATER PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE

1.	OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.	550		*
2.	POTENTIAL TO RELEASE: Depth to aquifer: _____ feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.1.2.			
	LR=	**550**		

TARGETS

		Score	Data Type	Refs
	Are any wells part of a blended system? Yes _____ No **X** If yes, attach a page to show apportionment calculations.			
3.	ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: 0 people x 10 = 0 Level II: 0 people x 1 = 0 **Total =**	**0**		62
4.	POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1	**22.1**		62
5.	NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well Score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign "0".	**9**		62
6.	WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a groundwater observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign "0".	**0**		60
7.	RESOURCES: Assign a score of 5 if one or more groundwater resource applies; assign "0" if none applies. * Irrigation (5 acre minimum) of commercial food crops or commercial forage crops * Watering of commercial livestock * Ingredient in commercial food preparation * Supply for commercial aquaculture * Supply for a major or designated water recreation area, excluding drinking water use	**5**		**
	Sum of Targets T =	**36.1**		

Notes:
1) * - To be conservative, an observed release is assumed.
2) **- To be conservative it is assumed that there are groundwater resources.

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUNDWATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

Distance From Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	Pop. Value	Ref.
0 to 1/4 mile	**0**	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	**0**	62
> 1/4 to 1/2 mile	**0**	18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	**0**	62
> 1/2 to 1 mile	**78**	9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385	**17**	62
> 1 to 2 mile	**437**	5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842	**94**	62
> 2 to 3 mile	**339**	3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219	**68**	62
> 3 to 4 mile	**487**	2	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596	**42**	62
Nearest Well =		**9**												**Sum =**	**221**	

SI Table 6b: Karst Aquifers

Distance From Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	Pop. Value	Ref.
0 to 1/4 mile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455		
> 1/4 to 1/2 mile		20	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122		
> 1/2 to 1 mile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
> 1 to 2 mile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
> 2 to 3 mile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
> 3 to 4 mile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
Nearest Well =														**Sum =**		

Notes:

GROUNDWATER PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS		SCORE	DATA TYPE	DOES NOT APPLY
8.	If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to groundwater.	10		
9.	Assign the highest groundwater toxicity / mobility value from SI Table 3 or 4. Substance(s): PCB, Arsenic, Cadmium; From Table: 3, 3, 3	10000		
10.	Multiply the ground water toxicity / mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)			

PRODUCT	WC Score	*
0	0	
>0 to <10	1	
10 to <100	2	
100 to <1,000	3	
1,000 to <10,000	6	
10,000 to <1E+05	10	
1E+05 to <1E+06	18	*
1E+06 to <1E+07	32	
1E+07 to 1E+08	56	
1E+08 or greater	100	

* check (x) the WC score calculated for the pathway

WC = 18

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the groundwater pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUNDWATER PATHWAY SCORE:

$$\frac{LR \times T \times WC}{82{,}500} =$$

4.33

Maximum of (100)

Notes:

Alt. Scenario: $\frac{550 \times (1{,}372.4) \times 18}{82{,}500} = 164.69$

SURFACE WATER PATHWAY

Surface drainage on the property collects in a series of catch basins, which connects to the storm drainage system on Morin Street. According to FMI, there is no permit requirement. The outfall of this drainage system flows through an intermittent stream approximately 985 feet to the probable point of entry (PPE #1) to the surface water pathway, a Thatcher Brook tributary. This tributary flows approximately 1.27 miles to Thatcher Brook, which then flows approximately 3 miles to its confluence with the Saco River. The Saco River eventually discharges into the Atlantic Ocean approximately 6 miles from that point (4; 57). The end of the 15-mile downstream pathway from PPE #1 is 5 miles in to the Atlantic Ocean. FMI also discharges 1000 gallons of wastewater a day to the Biddeford Wastewater Treatment Plant, PPE #2 (61). This discharges through the treatment plant into the Saco River just below Factory Island. It is approximately 4.5 miles from this PPE to the Atlantic Ocean.

Surface Water Pathway
Fiber Materials Inc., Biddeford

Water Body	Distance (miles)	Flow Rate (csf)	Wetlands (miles)
Unnamed Tributary (PPE #1) to Thacher Brook	1.27	5	2.35
Thacher Brook to the Saco River	3.27	14	2.3
Saco River to the WWTP (PPE #2)	4.71	3350	NA
Saco River to the Atlantic Ocean	10.27	3350	6.3
Atlantic Ocean	19.71	NA	NA

In 1989 through early 1990 there were a series of spills from the cooling tower in building #3. The water that was discharged into a tributary of Thacher Brook contained a chemical called Thoroguard, a biocide and chemical conditioner, which contains sodium molybdate and sodium nitrate (28:p3).

There are no drinking water intakes along the surface water pathway. Although the source of the Biddeford-Saco water supply is the Saco River, the pumping station is located approximately 1.8 miles upstream from the outfall of Thatcher Brook and not within the 15-mile downstream pathway from the site (62).

Thacher Brook, its tributary and the non tidal section of the Saco River are classified "Class B" water bodies under the Clean Water Act. This means the water is acceptable for recreational use, fish and wildlife habitats, agricultural and industrial supply (58). The estuarine sections of the surface water pathway are class SB: "Class SB waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hyroelectric power generation and navigation and as habitat for fish and other estuarine and marine life. The habitat shall be characterized as unimpaired." The tidal portion of the Saco River is classified SC "Class SC waters shall be of such quality that they are suitable for recreation in and on the water, fishing, aquaculture, propagation and restricted harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation and as a habitat for fish and other estuarine and marine life (58)".

There are 10.95 miles of wetlands along the surface water pathway (59). Thatcher Brook is rated moderate as a fishery habitat and rated high as a deer wintering area. High, moderate and low are ratings given by the Maine Department of Inland Fisheries and Wildlife to express the sensitivity of the area. A high rating indicates the presence of many species. There are 29 State listed sensitive environments in the Atlantic Ocean, 2 in Thacher Brook and 2 in the Saco River.

Figure 3: Surface Water Pathway

Fiber Materials, Inc Facility
Biddeford, Maine

PPE #1

PPE #2

Fiber Materials, Inc

15 Mile Surface Pathway Limit

Buxton
Dayton
Saco
Old Orchard Beach
Scarborough
Lyman
Biddeford
Arundel
Kennebunk
Kennebunkport
Wells

- Site
- Wastewater Outfalls
- Private
- Park Road
- Seasonal parkway
- State aided
- State hwy
- Town Road - summer
- Town Road - winter
- Toll highway
- Town Road
- Streams
- Island
- Marine
- Estuarine
- Rivers
- Town Boundary

Data Sources: Background hydrologic, topographic and political features are from Maine OGIS data layers with an accuracy of +/- 40 ft.

Facility structures digitized from CAD file produced by Fiber Materials, Inc and georeferenced digitial orthophoto quad.

Sample locations and stream data collected by Maine DEP using Trmble Pro-XR GPS unit on September 13, 2001. Accuracy +\- 3 ft.

Map prepared by: Chris Halsted
Maine DEP GIS Unit, 9/3/02
Revised 10/15/03

THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY

N
W E
S

0 0.75 1.5 Miles

Figure 4: Sample Locations

Fiber Materials, Inc Facility
Biddeford, Maine

PPE

SD-04

BKSD-01 BKSD-02

SD-03

Unnamed Tributary

PRECOURT STREET

MORIN STREET

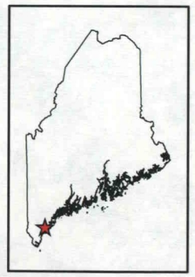
GRAY'S LANE

ELM ST

DRAPEAU STREET

SEDIMENT SAMPLE
Public_Drinking_Water_Wells
CATCH BASIN
BUILDING
Elevation_Contours
INTERMITTENT STREAM
Streams
Rivers
Large Wetlands (polys)
DRIVEWAY
FENCE
PAVED ROAD

Private
Park Road
Seasonal parkway
State aided
State hwy
Town Road - summer
Town Road - winter
Toll highway
Town Road
Railroads



Data Sources: Background hydrologic, topographic and political features are from Maine OGIS data layers with an accuracy of +/- 40 ft.

Facility structures digitized from CAD file produced by Fiber Materials, Inc and georeferenced digitial orthophoto quad.

Sample locations and stream data collected by Maine DEP using Trmble Pro-XR GPS unit on September 13, 2001. Accuracy +\- 3 ft.

Map prepared by: Chris Halsted
Maine DEP GIS Unit, September 3, 2002.

THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY

N
W E
S

0 50 100 200
Feet

15A

SI Table 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

List all substances that meet the criteria for an observed release to surface water; however, do not elimimate a substance from this table if it has a bioaccumulation factor (BCF) less than 500.

Sample ID	Hazardous Substance	Substance Concentration µg/kg	Bckgrd. I.D.	Bckgrd. Conc. µg/kg	BCF	Toxicity x Persistence	Tox. x Pers. x Bioacc.	Ecotox. x Pers. x Ecobioacc.	References
Volatile Organic Compounds - (VOCs)									
Semi-Volatile Organic Compounds - (SVOCs)									
PCB/Pesticides									
Metals/Cyanide									
				Highest Values					

Notes: There was no Observed Release to the Surface Water Pathway. Hazardous Substances were detected in an intermittent Stream which flows to the surface water pathway (3).

SI Table 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Note: Convert all results and SCDM values to ppb or µg/L.
If sum of percents calculated for I or J index is > or = 100%, consider the intake a Level I target;
If sum of percents calculated for I or J index is < 100%, consider the intake a Level II target.

Intake ID: Sample Type: Level I: Level II: Population Served: References:

Sample ID	Hazardous Substance	Conc. (ug/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	RfD (J Index)	% of RfD	Cancer Risk Conc. (I Index)	% of Cancer Risk Conc.
Volatile Organic Compounds - (VOCs)								
Semi-Volatile Organic Compounds - (SVOCs)								
PCB/Pesticides								
Metals/Cyanide								
			Highest Percent		Sum of Percents		Sum of Percents	

SCDM Version: June 1996

Notes: **There are no drinking water intakes along the surface water pathway (62).**

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION

		Score	Data Type	Refs
1.	OBSERVED RELEASE: If sampling data or direct obsevation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550		3
2.	POTENTIAL TO RELEASE: Distance to surface water: _____ feet If sampling data do not support a release to surface water in the watershed, use the table below to assign a score based on distance to surface water and flood frequency.			

Distance to surface water < 2,500 feet	500
Distance to surface water > 2,500 feet, and;	
Site in annual or 10-yr floodplain	500
Site in 100-yr floodplain	400
Site in 500-yr floodplain	300
Site outside 500-yr floodplain	100

Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2.

LR = 550

LIKELIHOOD OF RELEASE- GROUNDWATER TO SURFACE WATER MIGRATION

		Score	Data Type	Refs
1.	OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. NOTE: Evaluate groundwater to surface water migration only for a surface water body that meets all of the following conditions. 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than "0". 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer: _____ Elevation of bottom of surface water body: _____			
2.	POTENTIAL TO RELEASE: Use the groundwater potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2			

LR = 0

Note: Groundwater elevation is expected to fluctuate based on variations in precipitation and other factors.

DRINKING WATER THREAT TARGETS	Score	Data Type	Refs
Record the water body type, flow, and number of people served by each drinking water intake within the distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign "0" to factors 3, 4, and 5.			

Intake Name	Water Body Type	Flow	People Served

Are any intakes part of a blended system?

Yes _____ No ___

If yes, attach a page to show appointment calculations.

3.	ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).					
		_____,		_____		
	Level I:	_____	people x 10 =	_____		
	Level II:	_____	people x 1 =	_____	**Total =**	**0** 62
4.	POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.				**0**	62
5.	NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watersehd, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign "0".				**0**	62
6.	RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign "0" if none applies. * Irrigation (5 arces minimum) of commercial food crops or commercial forage crops; * Watering of commercial livestock; * Ingredient in commercial food preparation; and * Major or designated water recreation area, excluding drinking water use.				**5**	*
				Sum of Targets =	**5**	

Notes: * - resources are assumed.

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY (a)

Type of Surface Water Body (b)	Pop.	Nearest Intake	Number of people: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	Number of people: 30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	3,000,001 to 10,000,000	Pop. Value
Minimal Stream (< 10 cfs)		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	5,213,590	
Small to Moderate Stream (10 to 100 cfs)		2	0.4	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,245	521,359	
Moderate to Large Stream (> 100 to 1,000 cfs)		0	0.04	0.2	0.5	2	5	16	52	163	521	1,633	5,214	16,325	52,136	
Large Stream to River (> 1,000 to 10,000 cfs)		0	0.004	0.02	0.05	0.2	0.5	2	5	16	52	163	521	1,632	5,214	
Large River (> 10,000 to 100,000 cfs)		0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	163	521	
Very Large River (> 100,000 cfs)		0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	
Shallow Ocean Zone or Great Lake (depth < 20 feet)		0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	163	521	
Moderate Ocean Zone or Great Lake (depth 20 to 200 feet)		0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	
Deep Ocean Zone or Great Lake (depth > 200 feet)		0	0	0	0	0.001	0.003	0.008	0.03	0.08	0.3	1	3	8	26	
3-Mile Mixing Zone in Quiet Flowing River (> or = 10 cfs)		10	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	2,606,795	
	Nearest Intake =														Sum =	#REF!

Notes:

1) **There are no drinking water intakes along the surface water pathway (62).**

(a) Round the number of people to nearest interger. Do not round the assigned dilution-weighted populaton value to nearest integer.

(b) Treat each lake as a separate type of water body and assign it a dilution-weighted population value using the surface water body type with the same dilution weight from HRS Table 4-13 as the lake. If drinking water is withdrawn from coastal tidal water or the ocean, assign a dilution-weighted population value to it using the surface water body type with the same dilution weight from HRS Table 4-13 as the coastal tidal water or the ocean zone.

SI Table 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Notes: Convert all results and SCDM values to µg/kg or ppb.
If sum of percents calculated for I or J Index is > or = 100%, consider the fishery a Level I target;
If sum of percents calculated for I or J Index is < 100%, consider the fishery a Level II target.
List only those substances that meet the observed release criteria in a fishery within the target distance limit and have a BCF of > or = 500;
BCF values are found on SI Table 7.

Fishery I.D. Sample Type: Level I: Level II: References:

Sample ID	Hazardous Substance	Conc. (µg/kg)	Benchmark Conc. (FDAAL)	% of Benchmark	RfD (J Index)	% of RfD	Cancer Risk Conc. (I Index)	% of Cancer Risk Conc.
Volatile Organic Compounds - (VOCs)								
Semi-Volatile Organic Compounds - (SVOCs)								
PCB/Pesticides								
Metals/Cyanide								
Reference Sample:								
			Highest Percent		Sum of Percents		Sum of Percents	

Notes: 1.) **There was no observed release to a fishery documented (3).**
2.) µg/kg - microgram per kilogram; NL - not listed in SCDM Version June 1996.

SI Table 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Notes: Convert all results and SCDM values to µg/kg or ppb.
If sum of percents calculated for I or J Index is > or = 100%, consider the fishery a Level I target;
If sum of percents calculated for I or J Index is < 100%, consider the fishery a Level II target.

Environmental I.D.: Sample Type: Level I: Level II: Environmental Value:

Sample ID	Hazardous Substance	Conc. (ug/kg)	Benchmark Conc. (AWQC or AALAC)	% of Benchmark	References
Volatile Organic Compounds - (VOCs)					
Semi-Volatile Organic Compounds - (SVOCs)					
PCB/Pesticides					
Metals/Cyanide					
			Highest Percent		

SCDM Version: June 1996
References:
Notes: **There was no observed release to the Surface Water Pathway (3).**

HUMAN FOOD CHAIN THREAT WORKSHEET

HUMAN FOOD CHAIN THREAT TARGETS	Score	Data Type	Refs
Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.			
Fishery Name: Unnamed Tributary Water Body: stream Flow: 5 cfs Species: Production: lbs/yr Species: Production: lbs/yr Species: Production: lbs/yr			4; 64; 65
Fishery Name: Thacher Brook Water Body: stream Flow: 14 cfs Species: Production: lbs/yr Species: Production: lbs/yr			
Fishery Name: Saco River Water Body: River Flow: 3350 cfs Species: Production: lbs/yr Species: Production: lbs/yr			

FOOD CHAIN INDIVIDUAL (Select highest value)

7. ACTUAL CONTAMINATED FISHERIES

Assign 50 points for a Level I fishery only if tissue samples document an observed release of a substance with a bioaccumulation factor (BCF) greater than or equal to 500 to a fishery within the target distance limit (SI Table 10). List substances:

Substance: _____
Substance: _____

Assign 45 points for a Level II fishery if surface water/sediment samples document an observed release of a substance with a bioaccumulation factor greater than or equal to 500 to a fishery within the target distance limit (SI Table 10). List Substances:

Substance: _____
Substance: _____

8. POTENTIALLY CONTAMINATED FISHERIES:

Assign 20 points for a potential fishery if there is an observed release of a substance with a bioaccumulation factor greater than or equal to 500 (SI Table 7) to a watershed containing fisheries within the target distance limit, but no Level I or Level II fisheries are scored because there is no fishery documented between the PPE and the most downstream observed release sample point.

If there is no observed release of a substance with a BCF greater than or equal to 500 to a watershed, assign a value for potentially contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit.

Lowest Flow	FCI Value
<10 cfs	20
10 to 100 cfs	2
> 100 cfs, coastal tidal waters, oceans or Great Lakes	0
3-mile mixing zone in quiet flowing river	10

FCI Value =	20		3; 65
SUM OF TARGETS T =	**20**		

Notes:

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

ENVIRONMENTAL THREAT TARGETS

	Score	Data Type	Refs
Record the water body and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of "0" at the bottom of the page.			

Environment Type (SI Table 13)	Water Body Name	Flow	
2 State Listed Sensitive Environments; Wetlands; CWA	Thacher Brook	14	cfs
2 State Listed Sensitive Env.; Wetlands; CWA	Saco River	3350	cfs
Wetlands	Unnamed Tributary	5	cfs
29 State Listed Sensitive Env.	Atlantic Ocean	NA	cfs

58; 63; 64; 65

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

Substance(s): _____

From Table: _____

Environmental Type (SI Table 13)	Environment Value (SI Tables 13 & 14)	Multiplier (10 for Level I, 1 for Level II)		Product
		x	=	0
		x	=	0
		x	=	0

0

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

Flow		Dilution weight (SI Table 12)		Environmental Type and Value (SI Tables 13 & 14)			Pot. Cont.	Product
14	cfs	0.1	x	CWA	5	x	0.1	0.05
3350	cfs	0.001	x	CWA	5	x	0.1	0.0005
ocean	cfs	0.0001	x	29 State Sen. Env.	725	x	0.1	0.00725
14	cfs	0.1	x	2 State Sen. Env.	25	x	0.1	0.25
3350	cfs	0.001	x	2 State Sen. Env.	25	x	0.1	0.0025
5	cfs	1	x	2.3 mi. Wetlands	75	x	0.1	7.5
14	cfs	0.1	x	2.3 mi. Wetlands	75	x	0.1	0.75
3350	cfs	0.001	x	6.3 mi. Wetlands	150	x	0.1	0.015

8.57525

4; 58; 63; 64; 65

Notes:

8.57525

SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

*	Type of Surface Water Body		Assigned Dilution Weight
	Descriptor	**Flow Characteristics**	
	Minimal Stream	< 10 cfs	1
*	Small to Moderate Stream	10 to 100 cfs	0.1
	Moderate to Large Stream	> 100 to 1,000 cfs	0.01
*	Large Stream to River	> 1,000 to 10,000 cfs	0.001
	Large River	> 10,000 to 100,000 cfs	0.0001
	Very Large River	> 100,000 cfs	0.00001
	Coastal Tidal Waters	Flow not applicable; depth not applicable	0.0001
	Shallow Ocean Zone or Great Lake	Flow not applicable; depth less than 20 feet	0.0001
	Moderate Depth Ocean Zone or Great Lake	Flow no applicable; depth 20 to 200 feet	0.00001
	Deep Ocean Zone or Great Lake	Flow not applicable; depth greater than 200 feet	0.000005
	3-Mile Mixing Zone in Quiet Flowing River	10 cfs or greater	0.5

* Check (x) appropriate dilution weight.

Notes:

SI TABLE 13 (HRS TABLE 4-23)
SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

*	SENSITIVE ENVIRONMENT	ASSIGNED VALUE
	Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas indentified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monuments (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
	Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time. Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designation as recreation	75
	Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
* *	State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
*	State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
*	Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway)	

* Check (x) all environments impacted or potentially impacted by the site.

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

*	Total Length of Wetlands	Assigned Value
	Less that 0.1 mile	0
	0.1 to 1 mile	25
	Greater than 1 to 2 miles	50
*	Greater than 2 to 3 miles	75
*	Greater than 3 to 4 miles	100
*	Greater than 4 to 8 miles	150
	Greater than 8 to 12 miles	250
	Greater than 12 to 16 miles	350
	Greater than 16 to 20 miles	450
	Greater than 20 miles	500

* Check (x) highest value for each applicable flow characteristic.

Notes:

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS

	Score
11. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. If no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to surface water.	**100**

12. Assign the highest value from SI Table 3 or SI Table 7 for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.

	DWT	HFCT	ET
Substance(s):	PCB	Benzo(a)anthracene	Benzo(a) pyrene
Value:	10,000	5.00E+08	5.00E+08
From Table:	3	7	7

Note: Use footnotes if all substances can not fit in the table.

13. Multiply the toxicity and hazardous waste quanity scores. Assign the waste characteristics score for each threat from the table below.

Product	WC Score	DWT	HFCT	ET
0	0			
> 0 to < 10	1			
10 to < 100	2			
100 to < 1,000	3			
1,000 to < 10,000	6			
10,000 to <1E+05	10			
1E+05 to < 1E+06	18			
1E+06 to < 1E+07	32	*		
1E+07 to < 1E+08	56			
1E+08 to < 1E+09	100			
1E+09 to < 1E+10	180			
1E+10 to < 1E+11	320		*	*
1E+11 to < 1E+12	560			
1E+12 or greater	1,000			

* check (x) the WC score calculated for each threat

	Substance Value				Product	WC Score (from Table)	
Drinking Water Threat Toxicity/Persistence	10,000	x	1.E+02	=	1.E+06	**32**	(Max. of 100)
Food Chain Threat Toxicity/Persistence Bioaccumulation	500,000,000	x	100	=	5.E+10	**320**	(Max. of 1000)
Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation	500,000,000	x	100	=	5.E+10	**320**	(Max. of 1000)

SURFACE WATER PATHWAY THREAT SCORES

Threat (T)	Likelihood of Release (LR) Score	Target (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Calculated Threat Score LR x T x WC / 82,500	Overall Score	
Drinking Water (DW)	500	5	32	0.96969697	0.97	(max. of 100)
Human Food Chain (HFC)	500	20	320	38.78787879	38.79	(max. of 100)
Environmental (E)	500	8.57525	320	16.63078788	16.63	(max. of 60)
			Totals:	56.38836364	56.39	

Multiply LR by T and by WC. Divide the product by 82,500 for each threat (T). Sum the threat scores to obtain the surface water pathway score for each watershed/migration route. Select the highest watershed/migration route score. If the pathway score is greater than 100, assign 100.

SURFACE WATER PATHWAY CALCULATIONS

(DWT + HFCT + ET) = + + =

56

(maximum of 100)

Notes:

SOIL AND AIR PATHWAYS

The FMI facility is comprised of five buildings. Building 1 is one structure with three buildings attached together and is located on the northwest corner of the site. Each of the component buildings making up Building 1 were built at separate times and are currently referred to as Work Areas. Work Area 1 was built in 1975 and has an area of 20,000 square feet (ft^2). Work Area 2 and Work Area 6, both approximately 13,000 ft^2 were added in 1976 and 1979-1980 respectively. Building 3, located east of Building 1, was built in 1977 and has an area of 20,000 ft^2. Building 4, a two-story building built in 1977/1978, occupies 60,000 ft^2 on the east side of the property south of Building 3. Building 5 is located on the southeast corner or the site, was built in 1979/1980, and has an area of 20,000 ft^2. Built in 1980, the Hazardous Materials Storage Building along with the Nitrogen Storage Area is located near the northeast corner of the site. The #1 Hazardous Materials Storage Building has an area of approximately 600 ft^2 (4).

Parking areas on the property are paved although driveways around the buildings are unpaved. Grass and some shrubs surround most of the buildings. The southwest corner of the site is vegetated with shrubs and trees. During site visits several ledge outcrops at various locations throughout the site were noted.

Access to the property is restricted by a ten-foot high chain-linked fence with three strands of barbed wire on top. There is a visitor's parking area outside the fence with a pedestrian access gate. The employee's entrance is on the southwest corner of the lot in front of Building 5. Only employees may drive on the property during shift changes. The pedestrian gate and the employee vehicle gate are open from 6:00 AM to 7:00 PM Monday through Friday to allow visitors to enter and the employee shift changes. The FMI operation runs twenty-four hours a day with two twelve hour shifts and security is present at all times (4).

The nearest wetland to the FMI site is located about 150 feet northwest from the property line. There are hundreds of acres of wetlands within four miles of the site (59). There are 12 "rare or exemplary botanical features" within a four mile radius of the site (63).

There are a total of 110 employees who work in two 12-hour shifts. There are no residents, schools or daycare facilities on the site. The nearest resident lives approximately 50 feet away from the property line of FMI. Within the 4-mile radius of FMI, the population is varied between urban, suburban, and rural. The nearest school is a High School in Biddeford, located 2 miles southeast from the FMI site. Approximately 20,000 people reside within four miles of the FMI site (51). The following table breaks down the population per distance ring from the site.

Population Residing within Four Miles of
Fiber Materials Inc., Biddeford

Distance from facility (in miles)	Total
0.00-0.25	122
0.25-0.50	367
0.50-1.00	1270
1.00-2.00	4258
2.00-3.00	6233
3.00-4.00	8068
TOTAL	**20,318**

SI Table 15a: SOIL EXPOSURE OBSERVED CONTAMINATION SUBSTANCES

Sample ID	Hazardous Substance	Substance Concentration	Bckgrd. ID	Bckgrd. Conc.	Toxicity	References
Volative Organic Compounds - (VOCs)						
Semi - Volative Organic Compounds - (SVOCs)						
PCB/Pesticides						
Metals/Cyanide						
					Highest Toxicity	

Notes: No soil samples have been collected from the site.
For scoring purposes it is assumed that a release of a hazardous substance with a toxicity of 10,000 has been observed.

SI Table 15b: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Notes: Convert all results and SCDM values to µg/kg or ppb.
If sum of percent calculated for I or J Index is > or = 100%, consider residents Level I targets;
If sum of percent calculated for I or J Index is < 100%, consider residents Level II targets.

Residence ID: Level I: Level II: Population :

Sample ID	Hazardous Substance	Conc. (mg/kg)	RfD (J Index)	% of RfD	Cancer Risk Concentration	% of Cancer Risk Concentration	References
Volatile Organic Compounds - (VOCs)							
Semi - Volatile Organic Compounds - (SVOCs)							
PCB/Pesticides							
Metals/Cyanide							
Note:							
				Sum of Percent		Sum of Percents	

SOIL EXPOSURE PATHWAY WORKSHEET
RESIDENT POPULATION THREAT

LIKELIHOOD OF EXPOSURE	Score	Data Type	Refs
1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a score of "0". Note that a likelihood of exposure score of "0" results in a soil exposure pathway score of "0".	550		
LE =	**550**		

TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on the property and within 200 feet of areas of observed contamination (HRS section 5.1.3). Level I: _____ people x 10 = _____ Level II: _____ people x 1 = _____ **Sum =**	0		45
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (i.e. no Level I or Level II targets), assign "0" (HRS Section 5.1.3).	0		45
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities and within areas of observed contamination associated with the site.			

Number of Workers	Score
0	0
1 to 100	5
10 to 1,000	10
>1,000	15

	10		45
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value of each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.			

Terrestrial Sensitive Environment Type	Value
Sum =	

	0		63
6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on area of observed contamination at the site; assign "0" if none applies. * Commercial agriculture * Commercial siviculture * Commercial livestock production or commercial livestock grazing	5		*
Sum of Targets T =	15		

Notes: * Resources assumed

SOIL EXPOSURE PATHWAY WORKSHEET
NEARBY POPULATION THREAT

LIKELIHOOD OF EXPOSURE

			Score	Date Type	Ref.
7.	Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6)	Value: 5			
	Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value: 100			
		Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)	50		45
		LE =	50		

TARGETS

		Score	Date Type	Ref.
8.	Assign a score of "0" if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.	1		51
9.	Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e. properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5 - 10). Sum the population values and multiply by 0.1.	2.1		51
	T =	3.1		

Notes:

SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

*	TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
	Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
	Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
*	Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
	State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

* - Check (x) all environments impacted or potentially impacted by the site.

Notes:

SI TABLE 17 (HRS TABLE 5-6); ATTRACTIVENESS/ACCESSIBILITY VALUES

*	Area of Observed Contamination	Assigned Value
	Designated recreation area	100
	Regularly used for public recreation (for example, vacant lot in urban area)	75
	Accessible and unique recreational area (for example, vacant lots in urban area)	75
	Moderately accessible (may have some access improvements - for example, gravel road) with some public recreation use.	50
	Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
	Accessible with no public recreation use	10
*	Surrounded by maintained fence or combination of maintained fence and natural barriers	5
	Physically inaccessible to public, with no evidence of public recreation use	0

* Check (X) highest value.

SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

*	Total area of the areas of observed contamination (square feet)	Assigned Value
	less than or equal to 5,000 (0.115 acres)	5
	> 5,000 to 125,000 (0.115 - 2.87 acres)	20
	> 125,000 to 250,000 (2.87 - 5.74 acres)	40
	> 250,000 to 375,000 (5.75 - 8.6 acres)	60
	> 375,000 to 500,000 (8.6 - 11.5 acres)	80
	> 500,000 (11.5 acres)	100

* Check (X) highest value.

Notes:

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

Area of Contamination Factor Value	Attractiveness/Accessibility Factor Value						
	100	**75**	**50**	**25**	**10**	**5**	**0**
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

Note:

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREATS

Travel Distance Category (miles)	Pop.	Number of people within the travel distance category												Pop. Value
		0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	
Greater than 0 to 1/4	**122**	0	0.1	0.4	1	4	13	41	130	408	1,303	4,081	13,034	**4**
Greater than 1/4 to 1/2	**367**	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	**7**
Greater than 1/2 to 1	**1270**	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	**10**
													Sum=	**21**

References: 51
Notes:

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

		Score
10.	Assign the hazardous waste quantity score calculated for soil exposure.	10
11.	Assign the highest toxicity value for SI Table 15b or Table 3.	
	Substances(s): PCBs / Mercury /	
	Value: 10,000 / 10,000 /	
	From Table: 3 / 3 /	10000
12.	Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	

Product	WC Score	*
> 0	0	
≥ 0 to < 10	1	
≥ 10 to < 100	2	
≥ 100 to < 1,000	3	
≥ 1,000 to < 10,000	6	
≥ 10,000 to < 1E+05	10	
≥ 1E+5 to < 1E+6	18	*
≥ 1E+6 to < 1E+7	32	
≥ 1E+7 to < 1E+8	56	
≥ 1E+8 or greater	100	

* check (x) the WC score calculated for the pathway

WC= 18

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1: Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{LE \times T \times WC}{82{,}500} = \quad = 1.80$$

NEARBY POPULATION THREAT SCORE

(Likelihood of Exposure, Question 7: Targets = Sum of Questions 8, 9)

$$\frac{LE \times T \times WC}{82{,}500} = \quad = 0.03$$

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat =

Total Score = 1.83 (Maximum of 100)

Notes:

SI Table 21a: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Note: Mobility equals 1 for all observed release substances.

Sample ID	Hazardous Substance	Substance Concentration	Bckgrd. ID	Bckgrd. Conc.	Gaseous or Particulate	Toxicity/ Mobility	References
Volatile Organic Compounds - (VOCs)							
Semi - Volatile Organic Compounds - (SVOCs)							
PCB/Pesticides							
Metals/Cyanide							
					Highest Toxicity / Mobility		

Notes: There is no ongoing release to the air pathway.

SI Table 21b: AIR PATHWAY ACTUAL CONTMINATION TARGETS

Note: Convert all results and SCDM values to μg per cubic meter or ppb.

If sum of percents calculated for I or J index is > or = 100%, consider the targets as Level I;

If sum of percents calculated for I or J index is < 100%, consider the targets as Level II.

Sample ID: Level I: Level II: Distance from sources (mi):

Hazardous Substance	Conc. (μg/m3)	Toxicity/ Mobility	Benchmark Conc. (NAAQS or NESHARPS)	% of Benchmark	Cancer Risk Conc. (J Index)	% of Cancer Risk Conc.	RfD (I Index)	% of RfD	References
Volatile Organic Compounds - (VOCs)									
Semi - Volatile Organic Compounds - (SVOCs)									
PCB/Pesticides									
Metals/Cyanide									
Anhydeous Ammoina									
Chlorine gas									
	Highest Tox./ Mobility		Highest Percent		Sum of Percents		Sum of Percents		

SCDM Version: Jun-96

References:

NOTE: There are no actual contamination targets.

AIR PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE

		Score	Data Type	Refs
1.	OBSERVED RELEASE: If sampling data or direct observation support a release to the air, assign a score of 550. Record release substances on SI Table 21.			
2.	POTENTIAL TO RELEASE: If sampling data do not support a release to the air, assign a socre of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2)	500		
	LR=	500		

TARGETS

		Score	Data Type	Refs
3.	ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of hazardous substance to the air. Level I: _____ people x 10 = 0 Level II: _____ people x 1 = 0 **Total =**	0		
4.	POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply by 0.1.	14.1		51
5.	NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22.	20		51
6.	ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air.	0		63
7.	POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.	1.26		63
8.	RESOURCES: Assign a socre of 5 if one or more air resources applies within 1/2 mile of a source; assign a "0" if none applies. * Commercial agriculture * Commercial silviculture * Major or designated recreation area	5		*
	T =	40.36		

Sensitive Environment Type	Value
Wetland Acreage	**Value**

Notes:

* - to be conservative, resources are assumed.

AIR PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

		SCORE
9.	If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for scores available for air migration.	10
10.	Assign the highest air toxicity/mobility value from SI Table 21a or SI Table 3. Substances(s): Mercury Value: 2000 From Table: 3	2000
11.	Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	

Product	WC Score	*
0	0	
> 0 to < 10	1	
10 to < 100	2	
100 to < 1,000	3	
1,000 to < 10,000	6	
10,000 to < 1E+05	10	
1E+5 to < 1E+6	18	*
1E+6 to < 1E+7	32	
1E+7 to < 1E+8	56	
1E+8 or greater	100	

* check (x) the WC score calculated for the pathway.

WC= 10

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the air migration pathway score. If the pathway score is greater than 100, assign 100.

AIR MIGRATION PATHWAY CALCULATION:

$$\frac{LE \times T \times WC}{82{,}500} =$$

= 2.45

(Maximum of 100)

Notes:

SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

Distance From Site	Pop.	Nearest Individual (choose highest)	NUMBER OF PEOPLE WITHIN THE DISTANCE CATEGORY												Pop. Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	
On a source	**0**	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	**0**
0 to 1/4 mile	**122**	*	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	**41**
> 1/4 to 1/2 mile	**367**	2	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153	**28**
> 1/2 to 1 mile	**1270**	1	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119	**26**
> 1 to 2 mile	**4258**	0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326	**27**
> 2 to 3 mile	**6233**	0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755	**12**
> 3 to 4 mile	**8068**	0	0.005	0.02	0.07	0.2	0.7	2	7	28	73	229	730	2,285	**7**
	Nearest Individual =	**20**												**Sum =**	**141**

*Score = 20 if the Nearest Individual is within 1/8 mile of a source; score = 7 if the Nearest Individual is between 1/8 and 1/4 mile of a source.

References: 51

Notes:

SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

*	Wetland Area	Assigned Value
	< 1 acre	0
	1 to 50 acres	25
	> 50 to 100 acres	75
	> 100 to 150 acres	125
	> 150 to 200 acres	175
	> 200 to 300 acres	250
	> 300 to 400 acres	350
	> 400 to 500 acres	450
	> 500 acres	500

* Check (x) highest value.

Notes:

Ref: 59; 63

SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from SI Tables 13 and 23)			Product
			Name	Value	
On a Source	0.1	x			0
		x			0
0 to 1/4 mile	0.025	x	Wetlands	25	0.625
		x			0
		x			0
1/4 to 1/2 mile	0.0054	x	Wetlands	75	0.405
		x			0
		x			0
1/2 to 1 mile	0.0016	x	Wetlands	75	0.12
		x			0
		x			0
1 to 2 miles	0.0005	x	Wetlands	75	0.0375
		x			0
		x			0
2 to 3 miles	0.00023	x	Wetlands	75	0.01725
		x	6 State listed Sensitive Environments	150	0.0345
		x			0
3 to 4 miles	0.00014	x	Wetlands		0
		x	6 State listed Sensitive Environments	150	0.021
		x			0
> 4 miles	0	x			0
				Total Environments Score =	1.26

SITE SCORE CALCULATION		S	S^2
GROUNDWATER PATHWAY SCORE	(S_{GW})	4.33	18.77
SURFACE WATER PATHWAY SCORE	(S_{SW})	56.39	3179.65
SOIL EXPOSURE	(S_S)	1.83	3.36
AIR PATHWAY SCORE	(S_A)	2.45	5.98
SITE SCORE	$\sqrt{\frac{S_{GW}^2 + S_{SW}^2 + S_S^2 + S_A^2}{4}} =$		**28.32**
	$\sqrt{\frac{4.33^2 + 56.39^2 + 1.83^2 + 2.45^2}{4}} =$		

COMMENTS:

WARNING!!
EPA has determined that the status and HRS score of any site that is progressing towards listing on the NPL is a pre-decisional, formal rule making process and therefore deliberations regarding listing issues, the site status, and HRS scores cannot be released or discussed with non-Agency persons. For additional guidance see the April 30, 1993 OSWER Directive 9320.1-11.